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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,424	09/28/2000	GURJEET SINGH SAUND	5231.31-0127BS	7407

			EXAMINER
38492	7590	06/21/2004	COLEMAN, ERIC

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ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.

2a) ☐ This action is **FINAL**. ′ 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-53* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) *23-34 and 44-53* is/are allowed.

6) ☒ Claim(s) *1,2,5-8,10-14,16-21,35,36 and 38-42* is/are rejected.

7) ☒ Claim(s) *3,4,9,15,22,37 and 43* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>No. 3</u>.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2.   Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The scope of meaning of the limitations in claim 1 are not clear because line 5 ends in a period. Therefore it is unclear whether the limitations include all the limitations before the second period or only the limitations before the first period or something else.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 2,5,7,10-14,19,20,21 are rejected under 35 U.S.C. 102(b) as being anticipated by Yeh (patent No. 5,903,750).

5.   Yeh taught the invention as claimed including a data processing ("DP") system comprising: Means and method for decoding a macroinstruction of a computer, the

decoding of the macroinstruction generation a number of iterations of: a pattern of

microinstructions implementing a basic operation and a branch instruction predicted

taken (e.g., see figs. 1c, 2a, and col. 4, lines 38-58 and col. 6, line 3-col. 7, line 60)

wherein the decoding of the macroinstructions inherently provided microinstructions.

The branch instructions (claim 13,19) are taught as provided in a cache line and

therefore the separation of fields in the cache line comprised indicated boundaries

between the branches (e.g., see fig. 2b).

6.   As per claims 5,12,14 Yeh taught the decoding of instruction for execution. In

order for the instructions to be decoded for execution then it would been required that

microinstructions to implement the instruction were exposed to the programs. Yeh

taught a control of the cache/main memory managed by memory management unit

between main memory and the cache (e.g., see fig. 1a). As per claims 10,20 the Yeh

decoder ceases generating iterations when a termination condition of the

macroinstruction was detected in the instruction pipeline (e.g., see col. 7, lines 12-65)(a

first one or more iterations predicted not taken indicated by "0" and a secondary

iteration is predicted taken as indicated by a "1" that ends the production of not taken

iterations). Yeh taught (claim 11) updating the branch prediction table when a

misprediction was made (e.g., see col. 5, lines 8-24) and when the branch prediction

table was searched and contained a prediction for an instruction then the method the

iterated branches in a bundle was terminated (e.g., see col. 5, line 45-col. 6, line 2).

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.   Claims 6,8,16-18,35,36,38,39-42 rejected under 35 U.S.C. 103(a) as being

unpatentable over Yeh (patent No. 5,903,750).

9.   Yeh taught the invention substantially as claimed including a data processing

("DP") system comprising: (claims 36,38) Means and method for decoding a

macroinstruction of a computer, the decoding of the macroinstruction generation a

number of iterations of: a pattern of microinstructions implementing a basic operation

and a branch instruction predicted taken (e.g., see figs. 1c, 2a, and col. 4, lines 38-58,

and col. 6, lines 3-col. 7, line 60) wherein the decoding of the macroinstructions

inherently provided microinstructions.

10.   As per claim 5, Yeh taught the decoding of instruction for execution. In order for

the instructions to be decoded for execution then it would been required that

microinstructions to implement the instruction exposed to the programs.

11.   Yeh did not expressly detail claim 6,40,41 memory management unit between

cache and main memory where instructions of the microinstruction set are managed.

Yeh however taught the branch prediction for prediction instructions stored in the cache

(e.g., see fig. 1a) Therefore one of ordinary skill would have been motivated to provide a memory management unit to monitor and control the fetching data from cache and main memory and provide the predicted instruction. As per claims 8,16,17,18,35, Yeh taught flushing the pipeline when a misprediction was detected (e.g., see col. 5, lines 8-26) The invalidating of cache and memory entries that were overwritten was well known in the art at the time of the claimed invention at least to ensure that only valid data is used in subsequent fetching and processing. Therefore one of ordinary skill would have been motivated to invalidate locations in cache that were modified at least to ensure that data retrieved for processing from cache was valid data.

12.   As to the limitation of claim 39, Yeh taught instructions that were not tagged with instruction set of origin (e.g., see fig.2b)

13.   As to the limitations of claim 42, one of ordinary skill would have been motivated to add a marker to the instruction to indicate termination of the instruction so that when multiple instruction streams are employed the system (as well known in the art to speed program execution) could synchronize the execution of plural thread especially when instructions in one thread access one or more locations also accessed by another thread.

Allowable Subject Matter

14.   Claims 3-4,9,15,22,37,43 objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

15.   Claims 23-29,30-34,44-53 are allowed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Gupta (patent No. 5,127,092) disclosed a system for collective branching in a

multiple instruction stream multiprocessor (e.g., see abstract).

Kahle (patent No. 6,678,820) disclosed a processor for separately predicting

conditional branches dependent on lock acquisition (e.g., see abstract).

Shiell (patent No. 5,864,697) disclosed a microprocessor using combined actual

and speculative branch history prediction (e.g., see abstract).

Dwyer (patent No. 5,983,335) disclosed a computer system having organization

for multiple condition code setting and for testing instruction out-of-order (e.g., see

abstract).

Barnes (patent No. 4,412,303) disclosed a array processor architecture with

synchronization control (e.g., see abstract and fig. 4).

Henry (patent No. 6,571,331) disclosed static branch prediction mechanism for

conditional branch instructions (e.g., see abstract).

Gruner (patent No. 6,496,923) disclosed length decode to detect one-byte

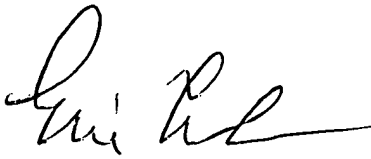prefixes and branch (e.g., see abstract).

Kamiya (6,029,222) disclosed a system for selectively marking instructions as interruptible or uninterruptible and judging interrupt requests based on the marked instruction (e.g., see abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Coleman whose telephone number is (703) 305-9674. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (703) 305-9712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EC

ERIC COLEMAN
PRIMARY EXAMINER

June 15, 2004